Three Important Themes and Sub-Themes in the History and Ecology of the Potomac River Basin

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The East/West Corridor

The outstanding theme associated with the Potomac is George Washington's vision of the River as "the great avenue into the Western Country." The Potomac provided the central hub in the life of our Nation's first president. He was born and died on its banks, his avocation as a surveyor was within the basin, he first met the colonial frontier in the valley, and his calling as a military leader came on the river and in defense of the Potomac Country for the British Crown. He utilized the river as a highway and as a source of food, income, and power, always at the cutting edge of technology. One measure of Washington's commitment to the Potomac was his ownership of about 12,000 acres of land in scattered locations throughout the basin. This association with the river strengthened Washington's life-long goal of "the practicability of an easy, and short communication between the Waters of the Ohio and Potomac." The goal had a practical expression in Washington's repeated efforts to remove the obstacles to navigation in the Potomac River.

This theme of the east-west corridor links together the history, transportation, and technology of the Potomac River Valley. Prior to the European invasion, land transportation was by trail, usually the improved trace of a game trail. Large mammals, bison and elk during historic times, picked the route needing the least energy and over the years the passage of animals engraved this trail on the landscape. Men followed these trails and the resulting paths became the established routes of travel. Water transportation was by the un-improved waterways of the region. When the paddlers encountered an obstruction they portaged their craft around it and continued their trip.

With the coming of the Europeans the paths were converted to roads and the roads were marked and maintained. There was constant dissatisfaction with the condition and means of supporting the roads. The answer devised by the legislatures was the entrepreneurial turnpike. With the development of land transportation, the waterways that had been highways now became obstacles. Initially fords were adequate, but, across wide water or with heavy, wheeled vehicles, ferries became a necessity. The constant demand for greater speed in travel led to the steady replacement of fords and ferries with bridges. In addition to greater speed there was a need and a desire for a smoother ride. It was discovered quite early that rails, at first wooden and later iron, would provide this smoother ride. The addition of steam-power gave all of the elements necessary to the success of the railroad. After the railroads reached their peak in the first quarter of the 20th century, theirs was a steady decline to the middle of the century, then, in the last quarter, a recovery of at least commuter railroads. Many of the abandoned rights-of-way have been converted to recreational areas through “rails to trails" projects.

The same trends that lead to the turnpike and railroad also led to the era of the canal. Many canals, including those built by the Pawtomack Canal Company, started by removing or going around obstacles to navigation. These were primarily skirting canals, but the demand for better navigation

led to 4,000 miles of continuous canals in the United States by 1850. The tremendous financial success of the 363-mile Eire Canal caused many to invest in less sound canals. The Chesapeake & Ohio Canal had the bad luck to start the same day as the Baltimore & Ohio Railroad and to follow the same route. The canal was built with all the normal appurtenances, including taverns.

Those in political control of Maryland were the same individuals as those with the primary financial interests in the B&O. Additionally Maryland's permission was necessary for any changes in the canal's charter. Baltimore merchants were able to keep the C&O from ever reaching the Chesapeake. The canal never recovered from giving the B&O a right-of-way into Harpers Ferry, which Maryland had demanded in exchange for the right to sell water for power inside the District of Columbia, but not in Maryland. Alexandria, fearful of losing out on the profits from the C&O, built its own connecting canal including an aqueduct bridge. The C&O connected into the never functional Washington Canal. Charles Fenton Mercer (1778-1858) the president of the C&O built a feeder canal from Loudoun County, Virginia, to the C&O, a canal that was never used. Repeated flood damage and competition from the B&O finally forced the C&O out of business.

But as General Washington recognized, the Potomac represented more than an avenue west--it also represented resources and water power. The river has, from the first, provided a rich fisheries resource remarked on by Captain Henry Fleet in 1631. Washington harvested the river to feed his establishment fish, both fresh and salt, to sell, and to fertilize his fields. The shad population in the river may be taken as an example of a fairly typical change in abundance overtime. Washington harvested a seemingly unlimited population of shad, in the 1832 harvest, 22,500,000 shad were taken. A century of over fishing, obstacles to upstream migration, and pollution have resulted in reducing a shad population to the status of threatened. Current efforts to bring back this once economically important species include plans to modify the Little Falls dam and an active stocking program. In addition to fisheries, mineral resources have been important on the Potomac. While Captain John Smith and his "gentlemen adventurers" were unsuccessful in their quest for gold, during the Civil War it was discovered on the banks of the Potomac. The area around Great Falls, Montgomery County, Maryland, was actively mined for gold from the 1880s to the 1940s. During the construction of the C&O canal, manganese was discovered and mined and refined for almost 100 years at Dargan Bend, Washington County, Maryland. "Bog-Iron was discovered by the Europeans in the tidewater and the piedmont beds were worked before the American Revolution with ironworks located along the Potomac and its tributaries where deposits of iron coincided with mill-seats for power, limestone for "flux," and forests for charcoal. Coal was known from before the European Invasion, but it was not utilized as a fuel until, by the middle of the 19th century, the forests had been destroyed, to produce charcoal.

An infinitely renewable resource of the Potomac watershed has always been its waterpower. The European colonists recognized this by adopting water laws, including mill seat rights, as some of their first legislation. As long as the Europeans remained confined to the tidewater, there were very few sites with enough feet of fall to power a water mill. During this period wind and tidal mills predominated, but as soon as settlement moved into the piedmont mill-seats became an important aspect of land grants. The individual mill evolved in two ways. With regard to the product processed: many mills started as saw mills and produced lumber until the area was cleared. Either seasonally or sequentially it milled grain, plaster, bone, wool, paper or was used for cutting stone. In size the mill changed from Plantation to Merchant to Factory Mill. Another important use of water power was in the production of iron and steel. All of these diverse themes are united through the life and interests of George Washington.

Migration, Establishment, and Conflict Of Cultures

The great national conflict of the Civil War is reflected in the microcosm of war on the Potomac. The states and their counties bordering the river were as divided as the nation at large and it was a result of a combination of factors as diverse as those of the national conflict. These factors were the result of the cultural diversity of the basin. The Anglican and Catholic slave-owning English immigrants, together with their African-American slaves, moved up the river, on both sides, from its mouth. The English Quakers and German Anabaptists moved south and west, crossing the river, from Pennsylvania. The North of Ireland Scots spread both north from the Carolinas and south from Pennsylvania into the agriculturally-poor mountain land. The several cultures met in Frederick County, Maryland, Loudoun County, Virginia, and in those Virginia counties that would become West Virginia. Even before this cultural conflict erupted, the indigenous people, sometimes with European allies, fought a losing war, as they were slowly pushed north and west.

In prehistory the first immigrant people following the retreating Wisconsin ice-sheet lived in rock shelters along the Potomac and followed this natural highway both east and west. The presence of a Paleo-Indian Clovis culture in the Potomac valley, by about 11,000 years before the present, is indicated by the presence of fluted points characteristic of that culture. Within the next 1,000 years the melting glaciers raised the level of the sea and created the Chesapeake Bay, by "drowning" the Susquehanna River valley. Many of the large mammals of the Ice Age either became extinct or retreated to the north. Eight thousand years ago forests began to replace the predominate grasslands in this area The culture of this period with its indigenous population comprise the Archaic Period. Many riverine locations have yielded evidence of occupation a change of culture from the predominately big game hunting of the Paleo-Indian/Clovis culture to the greater dependence on gathering, shellfish, and small game of the Archaic culture. For the first time stone mortars, pestles, and milling stones appear in the digs.

About 3,000 years ago the culture again changed to the Woodland period. About 2,000 years ago, corn (Indian corn or maize, *Zea mays*) was introduced into this area from the south and about 1,000 years later legumes (probably broad-beans, *Faba vulgaris*, and chick-peas, *Cicer arietinum*). Shortly after this, the archeological record starts to reflect a culture characteristic of the historic tribes of Native Americans primarily Algonquian groups east of the fall line and Siouan and Iroquoian tribes to the west. The Algonquians on the two sides of the Potomac had very different response to the European Invasion. Those to the south (the Powhatan Confederacy) had had previous European contact and were relatively strong when the English arrived in 1607. When, about 1620, the first economy of the Virginia colony, dependent on Native American fur trappers and on their agriculture for winter survival changed to a tobacco culture dependent on the Native American's cleared agricultural land, hostility developed; this resulted in "The First Tidewater War" of 1622.

When the English arrived on the north side of the river in 1634 the Algonquin (the Piscataway or Conoys) were naive about Europeans and were being sorely pressed by the Susquhanocks from the north and east. They greeted the Europeans as potential allies. It was not until the treachery of the colonists, at the Susquhanock Fort at the mouth of Piscataway Creek, that there was serious conflict with the Indian Nations of Maryland. The rate at which the indigenous people were pushed northward and westward can be estimated by the dates of the erection of new Maryland Counties along the Potomac (St. Mary's, 1637; Charles, 1650; Prince George's, 1695; Frederick, 1745; Montgomery, 1776; Washington, 1776; Allegany, 1789; and Garrett, 1872).

The mid-18th century conflict between Great Britain and France over the Ohio River Valley embroiled the Potomac country in this dispute and indirectly led to the establishment of new centers of population around the newly built forts. On May 17, 1756, war was officially declared between England and France, known in Europe as the Seven Years War and in America as the French and Indian War. On November 24, 1758, Brigadier General John Forbes was approaching Fort Duquesne (Pittsburgh) with an overwhelming force when the French commander, Francois de Lignery, torched the fort. The English built a new fort, Fort Pitt, where the Allegheny and the Monongahela Rivers join to form the Ohio. The Treaty of Paris in 1763 brought an end to French power in North America. The end of this war and the ruthless suppression of the Pontiac "Conspiracy" ended the power of the Native Americans in the Potomac basin. England's efforts to make the colonies share in the cost of this war led directly to the American Revolution.

After the American Revolution, the adoption of the new Constitution, and the election of General Washington as the nation's first president, it still remained to select a capital for the new nation. President Washington selected a ten-mile square on both sides of the Potomac at the mouth of the Eastern Branch (Anacostia). The new capital was a growing city and like most American cities it was drawing its population from all over the world. The first wave of immigrants were Irish soon followed by Germans. Both groups competed for the same jobs. The growing tension between the ethic groups and the old English establishment culminated in the American (Know-nothing) Party's capturing the city electorally and the election riots of 1857. This same ethnic diversity throughout the Potomac basin is reflected in the arts and crafts of the individual communities.

The capital was a southern city housing a Congress that represented the entire country. The national conflict over slavery was reflected in local incidents. It was natural that the great sectional conflict, the Civil War, would center on Washington and thus on the Potomac River. It became the target of attack for the Confederate States and a center of defense for the Union. The final two years of the war included some of fighting closest to Washington and culminated in the tragedy of the assassination of President Lincoln. The "Great War of Rebellion" is certainly the ultimate in cultural conflict.

Creation, Destruction, And Rebirth Of An Ecosystem

The Potomac Basin reflects the earth forces that have shaped it through geological time into its present magnificent form. There have been many ecological changes overtime. The ecosystems have been modified by each resident human culture for the last 14,000 years. A slow degradation, due primarily to the activities of man, culminated in rapid destruction of habitat coincident with industrialization and over-population. For the past fifty years there has been a steady, but slow, repair of the natural fabric of the ecosystem resulting in the threatened fragile structure we enjoy today.

Today there is greater interest in ecology than ever before. However, many address it only as a problem in the biological sciences, ignoring the effects of man as an integral element, or, when dealt with by the social scientists, as though man were the only agent effecting change. The other major dimension of ecological change, that is consistently minimized or ignored by both groups, is that of time. The field of geomorphology was shaped by three landmark publications of the first half of the 19th century and the theories they contained or amplified. In 1886, William Morris Davis of the Pennsylvania Geological Survey published a paper in the first volume of the *National Geographic Magazine* entitled, "Rivers and Valleys of Pennsylvania." With only a very few modern modifications this paper sets forth the current interpretation of not only the geomorphology of this

area, but also of most of the world's landscapes. The physical factors continuing to shape the Potomac River system involve four processes: (1) the formation of wind and water gaps by erosion; (2) the headwater migration of divides; (3) stream piracy; and (4) the adjustment to stream structure.

About 735 million years ago the Allegheny Mountains began to rise. This continuing phenomenon and subsequent deposition and erosion account for the northeast/southwest ridges and valleys that characterize this region. Wind and water gaps are located: where resistant rocks have relatively narrow outcrops; where rocks are thinly layered, vesicular, or weak; at faults; or where the under lying limestone can be dissolved by water action. About 160 million years ago a super continent began to break apart to form the modern continents of North America, South America and Africa. This continuing breakup is called the Atlantic expansion and has resulted in the drainage of the east coast shifting directions, from emptying toward the center of the continent, to an eastward flow into the broadening Atlantic Ocean. The topographic changes over the next 146 million years have resulted in the present river. They included:

- a huge meteorite impacting (ca. 35 million years ago) at what is today the mouth of the Chesapeake Bay, creating a giant crater and further affecting the direction of flow of the proto-rivers;
- the westward erosion of the headwaters of the Ancient Potomac captured other drainage systems, such as the Shenandoah, and thus increased the size of the basin;
- the river wearing down the heights, produced by sedimentation and the ongoing lift of the plateau, has produced water and wind gaps.

By about two million years ago, the river was recognizable as the entity we have named the Potomac. The basin may, most conveniently, be divided into six physiographic provinces: the sediment-covered **Coastal Plain,** divided from the **Piedmont** by the fall line; the ancient crystalline rock **Blue Ridge** mountains; the **Great Valley**, consisting of: the Shenandoah Valley south of the river and the Cumberland Valley north of the river; the rippled **Ridge and Valley** portion of the Appalachian Highlands; and the eastern front of the **Allegheny Plateau.**

Traveling through these provinces one is able to study geology as well as geomorphology. The Rock Cycle is demonstrated repeatedly, but nowhere as graphically as at Sidling Hill Visitors' Center in Washington County, Maryland. We go back in time when studying the rocks of the basin, and fortunately we can also retreat in time by visiting some very special ecosystems. Fossils and pollen allow us to reconstruct the ecological changes over time until the archaeological record begins in the late Pleistocene. During the most recent inter-glacial period, about 100,000 years ago, there were great bald cypress swamps along the Potomac, the stumps still show up in excavation in Washington. While this community is rare in the basin, a cypress marsh may be reached by canoe in Pohick Creek Regional Park in Fairfax County, Virginia. From the following glacial period, we still have relict ice age communities in the basin. These are probably best called Muskegs, an Algonquin word meaning "trembling earth." Locally they are called quaking bogs, glades, swamps, marshes or bogs. They are at high enough altitude (ca. 1,000 meters) to remain a natural refrigerator with frosts in the summer months. Cranberry Swamp in Garrett County, Maryland, is a good example. Many arctic plants and animals have their southern-most distribution in these muskegs.

As the continental ice sheet withdrew a typically high latitude community filled in behind. This complex included caribou and muskoxen as well as several now extinct large ice age mammals. Beyond possibly playing some role in the extinction of some of the large mammals, the insignificant population of humans probably had little effect on the ecosystem of that time. With the change in climate the area filled with plant and animal assemblages not dissimilar from the deciduous forest we see today, but in greatly different proportions. There has been a Progressive extinction of much of the biota of the basin. Many plants have disappeared since the Pleistocene, some small and apparently insignificant, but some keystone species, for example the Chestnut and the American Elm. Some very numerous birds have disappeared, such as the Passenger Pigeon, the Carolina Parakeet, and the Ivory-billed Woodpecker. Many large herbivores, bison, and elk, are gone as are some large predators, wolves, and mountain lions. Game fish and shellfish that provided a commercial fishery (*e.g.* sturgeon, shad, striped bass, and oysters) have either disappeared or are so reduced in numbers that their taking is unprofitable. Other life forms have dramatically declined in number; however, some native species are more numerous today than ever before. The effects of alien organisms, plants, microbes, invertebrate, and vertebrate have all had a dramatic effect on the changing ecology. The various cultures to inhabit the valley have each altered the ecology. The indigenous people burned the undergrowth thus preventing catastrophic fires. The Europeans suppressed fire thus preserving fuel for major holocausts. As agriculture and urbanization took up more land, natural communities disappeared. With industrialization and chemical agriculture the river became polluted and by 1950 virtually died. A new environmental awareness has led to a cleaner Potomac and better conservation practices, but the battle is not over– we are still faced with challenges as well as hopeful prospects for the future.

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